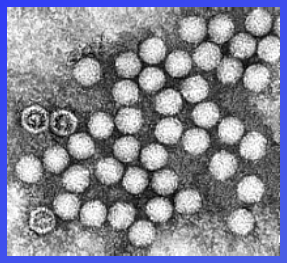
Polioviruses in the environment in Israel - Implications for the global poliomyelitis eradication initiative



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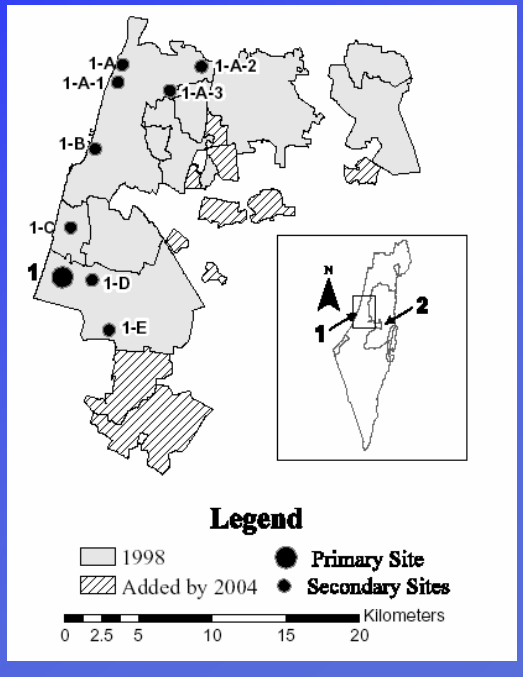
Environmental Burden Ambiguous aVDPV in Israel

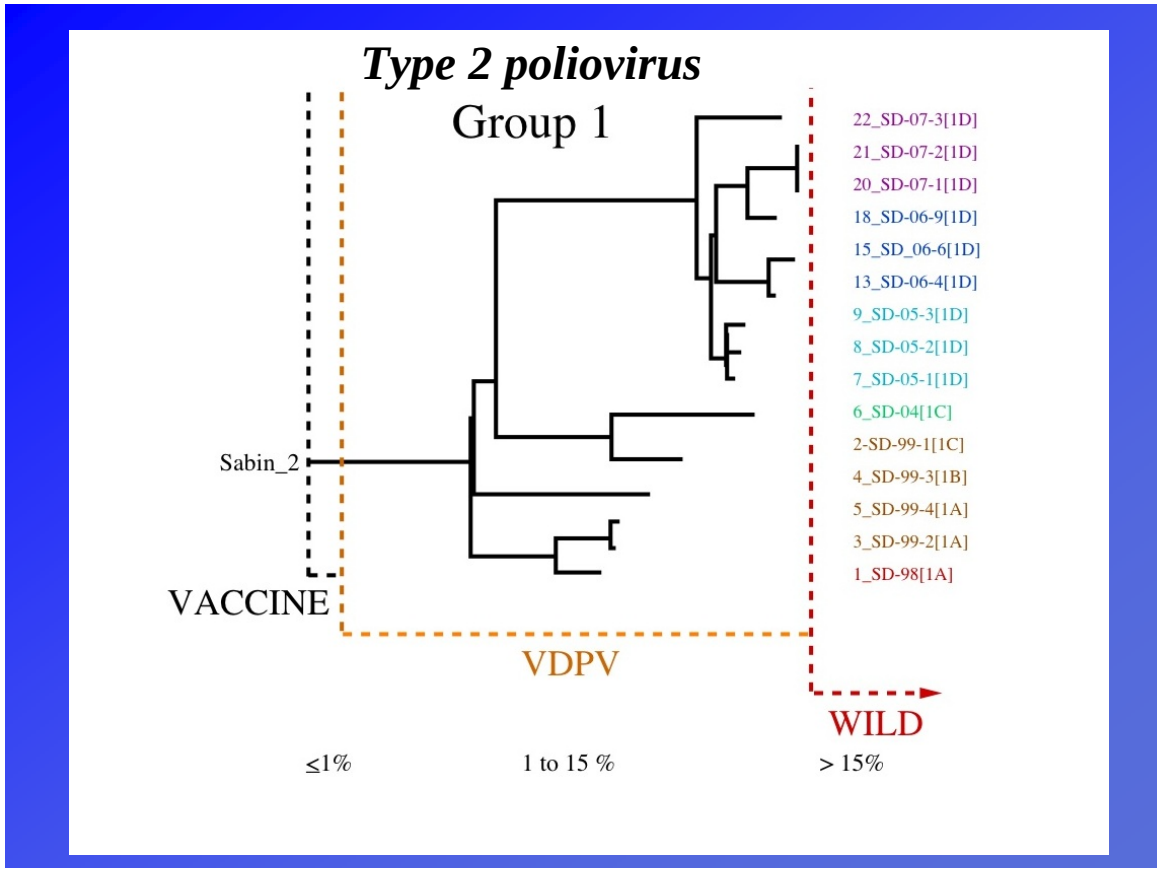
- 22 aVDPVs 7-14.5% diverged

Year	#	Site
1998	1	1
1999	4	1
2004	1	1
2005	3	1A
2006	1	2
2006	2	1A
2006	1	1A3
2006	6	1A1
2007	2	1A3
2007	1	1A

9 Years !

- Sites
  - Site 1 - 1.6 million people
  - Site 1A - 800,000 people
  - Site 1A1 - 50,000 people
  - Site 1A3 - 350,000 people
  - Site 2 - 0.8 million people




Type 2 poliovirus
Group 1
22_SD-07-3[1D]
21_SD-07-2[1D]
20_SD-07-1[1D]
18_SD-06-9[1D]
15_SD_06-6[1D]
13_SD-06-4[1D]
9_SD-05-3[1D]
8_SD-05-2[1D]
7_SD-05-1[1D]
6_SD-04[1C]
2-SD-99-1[1C]
4_SD-99-3[1B]
5_SD-99-4[1A]
3_SD-99-2[1A]
1_SD-98[1A]
Sabin_2
VACCINE
VDPV
WILD
≤1%
1 to 15 %
> 15%

In conclusion

- We find at least 2 sources of aVDPV from sewage from documented highly immune populations (2+ million)
- Detection has been intermittent, yet excretion into the environment has continued for at least 9 years.
- Isolates are highly diverged (8.7% to 14.5%)
- Isolates are highly neurovirulent.
  - Genotyping - reversion to neurovirulence,
  - This phenotype has been confirmed in animal model

In conclusion

- Population immunity
  - Genotype: numerous alterations in NAg sites
  - There is waning immunity in the adult cohort with some individuals (~7%) loosing circulating protective antibody titers against these aVDPVs
- We have not yet located the sources, nor is it likely that we will be able to do so in the immediate future.
- Problems:
  - Containment of “wild” polioviruses
  - Cessation of vaccination
- Question: how wide-spread is this re-emergence phenomenon?

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